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Subattractor Dynamics in Real-Time Mental Processing

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Abstract: Abstract: When a person forms a mental representation, a full set of features may not be instantiated instantaneously. Rather, high features may arrive to the self-organizing representation at a quicker rate than low features, where high and low refer to the intercorrelational strength between a given feature and all the other features relevant to the concept within the system (McRae, de Sa & Seidenberg 1997). We tracked streaming x,y coordinates of human arm movements in a picture-labeling task whereby participants classified pictures (e.g. a picture of lettuce) into response boxes providing potential lexical labels (e.g. green vs. lettuce). For features that describe surface properties of the object, maximum hand-movement deviation occurred significantly earlier to high features than to low features, t(39)=2.43, p=.019. Thus, the real-time construction of a mental representation may be described by "subattractor dynamics, with asymmetries in the dynamic time-scales of underlying features.